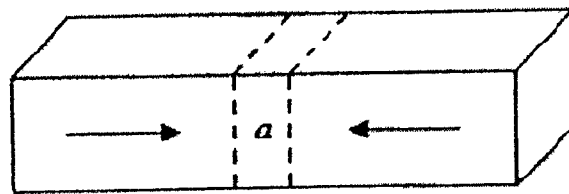
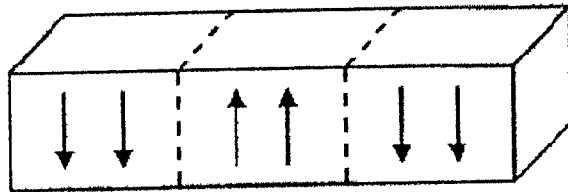


Figure 1



Longitudinal Recording Bits



Perpendicular Recording Bits

Figure 2

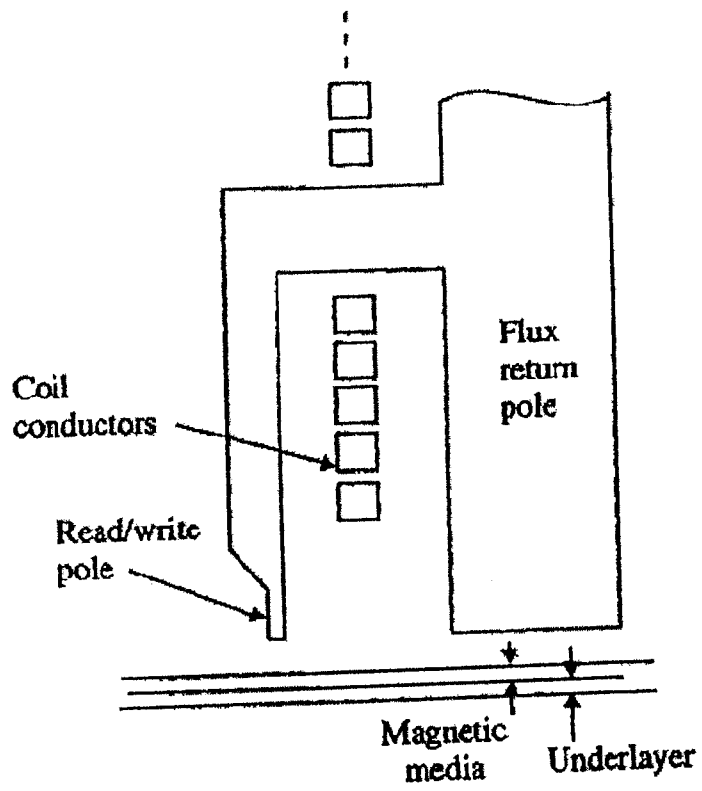
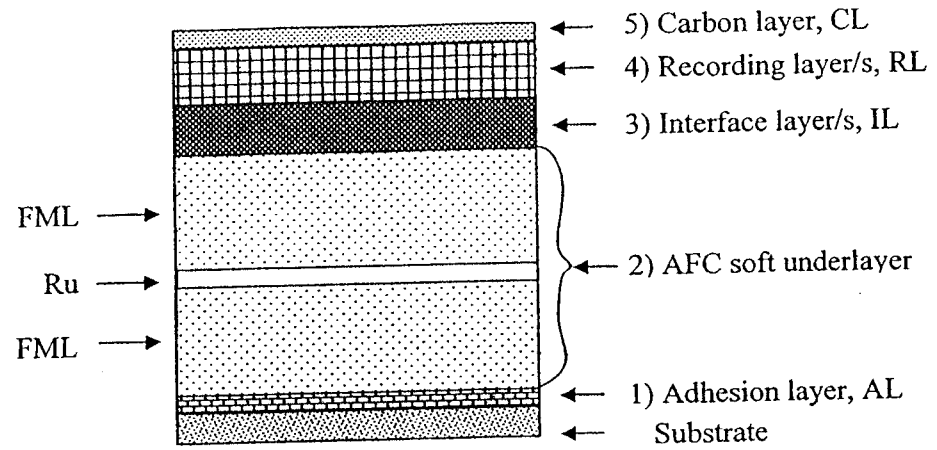
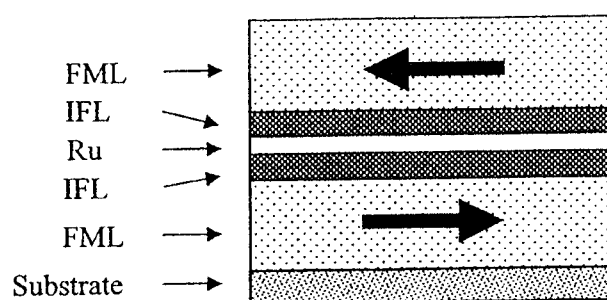
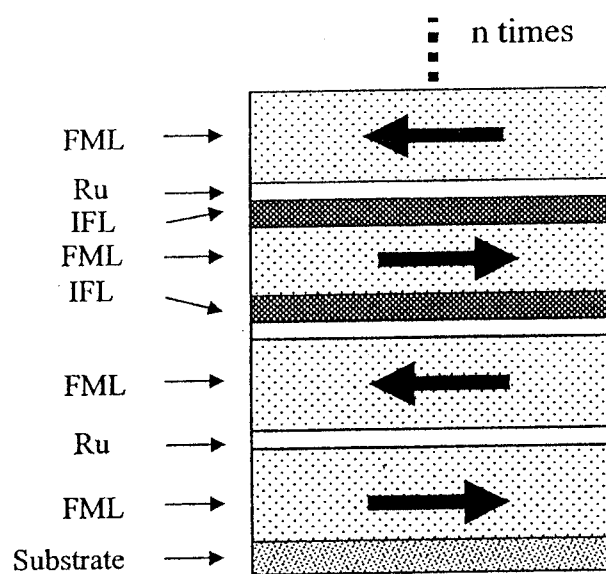


Figure 3

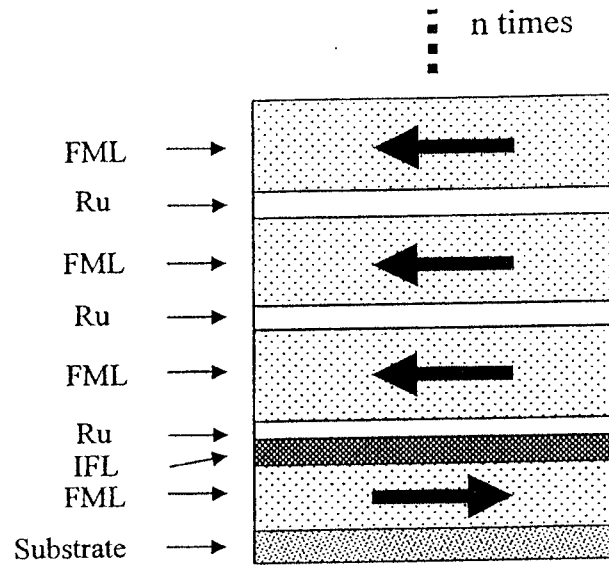


FML = Ferromagnetic layer

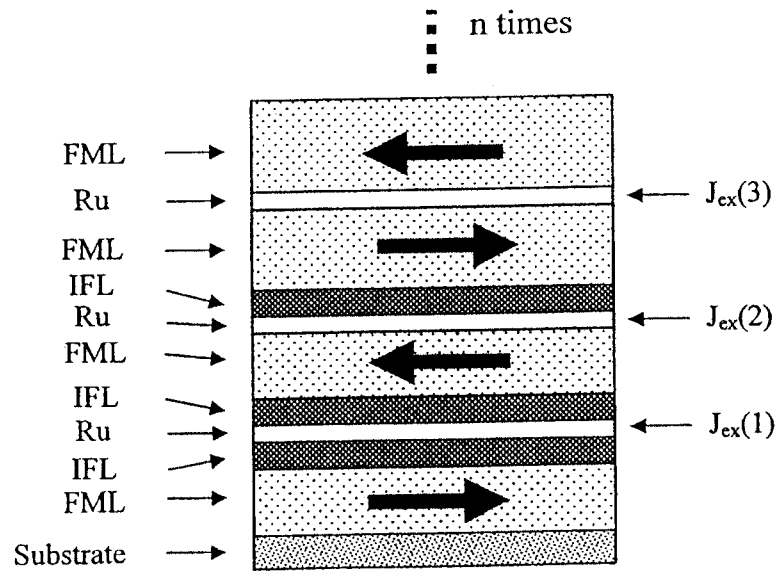
Figures 4 (a) and (b)**(a)****(b)**

Figures 4 (c) and (d)

(c)



(d)



$$J_{ex}(1) \geq J_{ex}(2) \geq J_{ex}(3) \geq \dots$$

Figure 5

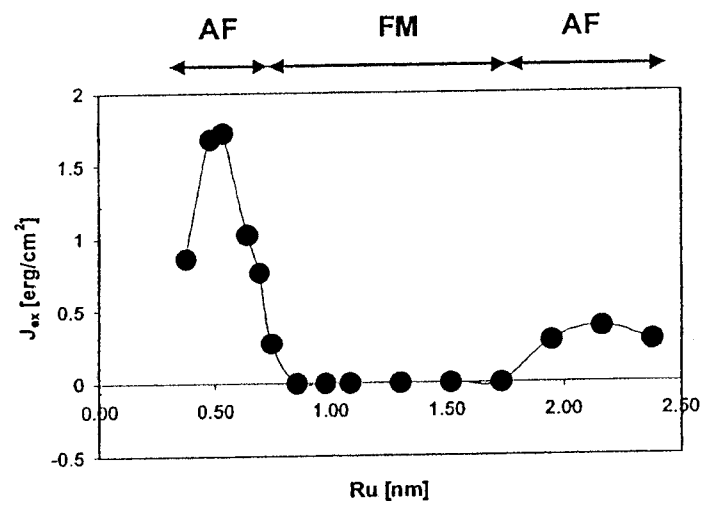


Figure 6

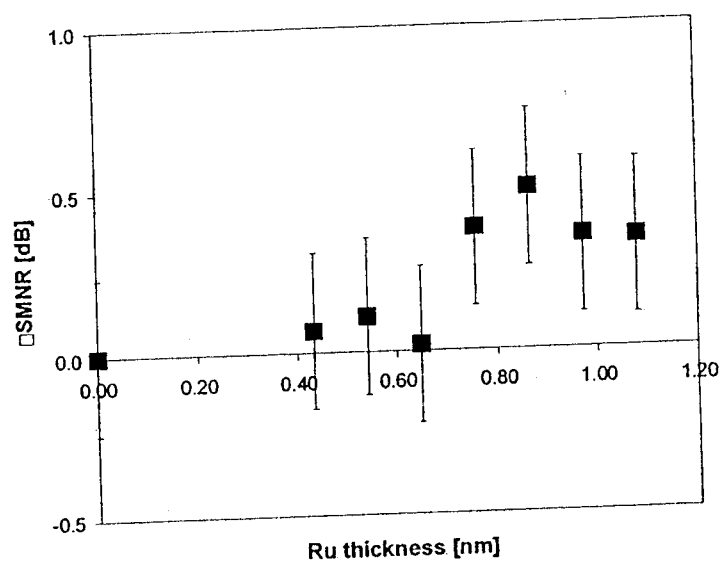


Figure 7

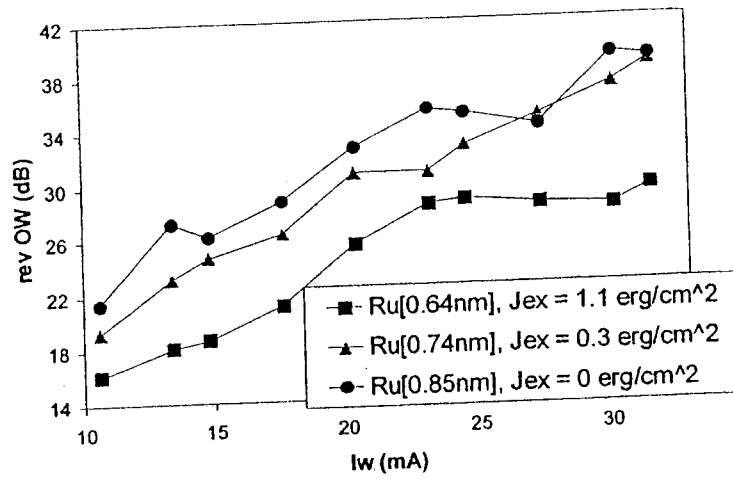


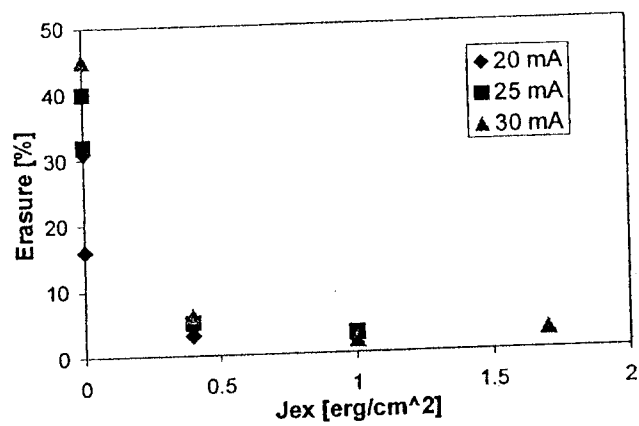
Figure 8

Figure 9

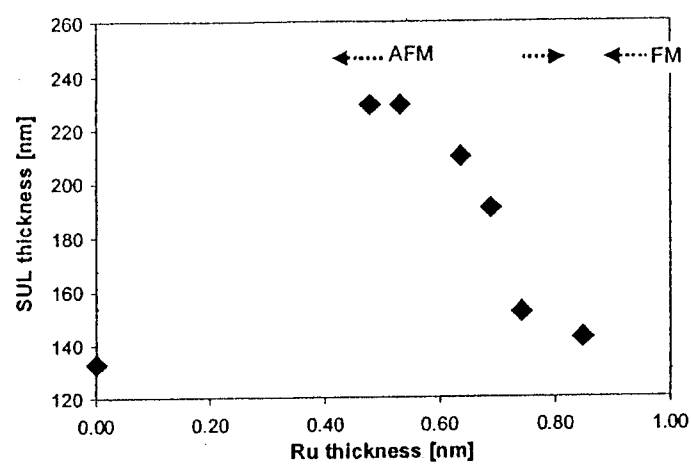


Figure 10

